



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/784,800	02/15/2001	Joseph S. Gordon	064441.0207	2724

31625 7590 11/12/2003

BAKER BOTTS L.L.P.
PATENT DEPARTMENT
98 SAN JACINTO BLVD., SUITE 1500
AUSTIN, TX 78701-4039

EXAMINER

CHANG, AUDREY Y

ART UNIT PAPER NUMBER

2872

DATE MAILED: 11/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/784,800

Applicant(s)

GORDON ET AL.

Examiner

Audrey Y. Chang

Art Unit

2872

-- **The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 7-14, 16-24 and 26-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 7-14, 16-24 and 26-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Remark

- This Office Action is in response to applicant's amendment filed on August 27, 2003, which has been entered as paper number 14.
- By this amendment, the applicant has amended claims 7, 8, 17, 18, 26 and has canceled claims 15 and 25.
- Claims 7-14, 16-24 and 26-30 remain pending in this application.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. **Claims 7-14, 16-24 and 26-30 are rejected under 35 U.S.C. 112, first paragraph**, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The specification fails to teach how could "a peak in transmission for normal incidence light" be "*shifted*" to a "wavelength greater than an exposure wavelength". The specification *discloses* only the spectrum for normal incident (angle of incidence at zero) of the light with "*exposure wavelength*", (please see Figure 5). It is not clear how to deduce from the spectrum that the peak transmission for normal incidence is at wavelength **greater** than the exposure wavelength and how to deduce the "shift" of peak transmission to a wavelength **greater** than the exposure wavelength. The spectrum for light having wavelength **not equal** to the exposure wavelength simply cannot be measured. This statement

Art Unit: 2872

therefore is wrong and needed to be explained more. Claims 8-16, 18-25 and 27-30 inherit the rejection from their respective based claim.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. **Claims 8 and 18 are rejected under 35 U.S.C. 112, second paragraph**, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The reasons for rejection are set forth in the previous Office Action dated March 27, 2003.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 7-14, 16-24, and 26-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Nose et al (PN. 5,742,386) in view of the patent issued to Fukumitsu et al (PN. 4,657,805).**

Claims 7, 17 and 26 have been amended that necessitate new grounds of rejections and they are set for as follows.

Nose et al teaches an *exposure system* for detecting foreign matter that is comprised of a *pellicle* (50), that is comprised of a *thin film*, fixed to a *pellicle frame* (51), made of *aluminum*, in order to cover a pattern portion on a *photomask* (52), (please see Figures 1 and 6, column 1, lines 44-54 and column 4).

Art Unit: 2872

Nose et al teaches that the pellicle with the thin film, having certain optical thickness, is capable of making the peaks of transmission of the light with incident angles at *off axis* (such as 10° , 30° , 60° as shown in Figure 7) to be at *100 percent*. This pellicle with thin film therefore is capable of *maximizing* the transmission of light at off axis at an exposure wavelength.

With regard to the features concerning the thin film produces a transmission maxima at a wavelength between one nanometer to twenty nanometer above the exposure wavelength, since the "exposure wavelength" is arbitrary defined in the incident application, the condition is implicitly met by identifying the exposure wavelength to always meet with the condition.

With regard to the feature concerning that the optical thickness of the pellicle film to *shift* a peak in transmission for normal incident light at a wavelength greater than an exposure wavelength, wherein the optical thickness also contributes to maximize transmission of the light having exposure wavelength at an incident angle greater than zero. Nose et al teaches that by varying the optical thickness of the pellicle film the maximized transmittance of the light of an exposure wavelength can be achieved at incident angles greater than zero as shown in Figure 7. Although this reference does not teach explicitly that for these thicknesses the transmittance of the normal incident will occur at wavelengths greater than the exposure wavelength, however such feature is implicitly included. Since it is known in the art that the maximum transmittance of the pellicle film for normal incident is determined by the equation: $m * \lambda = (2 * n) * d$, with m being an integer, λ being the exposure wavelength, n being the refractive index of the pellicle film and d being the thickness of the film. It can be easily calculated that for $n=1.5$ and the thickness d being $0.86 \mu\text{m}$ the wavelengths for having peak of transmission at normal incident is greater than the exposure wavelength $0.488 \mu\text{m}$, (as referred to Figure 7). By a simple calculation, the peak of transmission for normal incident could occur for light having wavelength of $0.51 \mu\text{m}$. Furthermore, Nose et al teaches that for a film thickness of $0.86 \mu\text{m}$, the pellicle is capable of creating peaks of transmission (100% transmission) for light with off-axis angles of incident. Although this reference does not teach

Art Unit: 2872

explicitly that the film thickness is equal to one-quarter of the exposure wavelength plus a design thickness, however such feature is implicitly met since one-quarter of the exposure wavelength as shown in Figure 7 of Nose is $0.122\text{ }\mu\text{m}$. The film thickness is $0.86\text{ }\mu\text{m}$, which means the film thickness is equal to $0.122\text{ }\mu\text{m}$ plus $0.738\text{ }\mu\text{m}$ with $0.738\text{ }\mu\text{m}$ being designated as the "design thickness".

Claims 7, 17 and 26 have been amended to include the feature that the thin film is an amorphous fluoropolymers, the Nose et al reference does not teach such explicitly. Fukumitsu et al in the same field of endeavor teaches a thin film pellicle for a photomask wherein the thin film is made of amorphous fluoropolymers that has a good transmittance in the ultraviolet and visible wavelength ranges, (please see the abstract). It would then have been obvious to one skilled in the art to apply the teachings of Fukumitsu et al to make the thin film pellicle of Nose et al with amorphous fluoropolymers for the benefit of using a suitable material that has good transmittance property to make the pellicle. Furthermore, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

Claims 7, 17 and 26 have further been amended to include the features of "the thin film formed to cooperate with a photomask and facilitate projection of an image including spatial information from the photomask onto a surface". As stated in the paragraphs above, Nose et al teaches that the pellicle (50) is formed to *cooperate* with a *photomask* (52) as shown in Figures 1 and 3). Nose et al further teaches the *photomask with the protective pellicle* is used in a *semiconductor device manufacturing apparatus*, (please see Figure 9) wherein the image information on the photomask is transferred onto a *wafer* (1110). It is implicitly true that the photomask has "opening" and has spatial information, i.e. physical pattern, that is transferred to the wafer to manufacture the semiconductor device, (please see Figure 9, column 1 lines 13-21 and column 7, lines 7-31).

With regard to claims 10-14, 20-24 and 27-30, the Nose et al reference does not teach explicitly to include anti-reflective coatings on the pellicle. Fukumitsu et al in the same field of endeavor teaches a dust cover for photomask reticle wherein the dust cover comprises a thin film (1) and an anti-reflective coating (3) on the top and bottom surfaces of the thin film, (please see Figures 1 and 2). Fukumitsu et al teaches that the anti-reflective coating has a thickness of about one quarter of the design wavelength and has a refractive index that is a square root of the refractive index of the thin film (1), which is therefore different from the refractive index of the thin film, (please see column 5, lines 8-50). It would then have been obvious to one skilled in the art to apply the teachings of Fukumitsu et al to add anti-reflective coating on top and bottom of the thin film pellicle of Nose et al for the benefit of improving the transmittance of the pellicle.

With regard to the features concerning the thin film produces a transmission maxima at a wavelength between one nanometer to twenty nanometer above the exposure wavelength, since the "exposure wavelength" is arbitrary defined, the condition is implicitly met by identifying the exposure wavelength to always meet with the condition.

With regard to claim 16, Nose et al teaches that the thickness of the thin film is about $0.86\mu\text{m}$, or 860 nanometers and Nose et al teaches that the exposure wavelength is about $0.488\mu\text{m}$ or 488 nanometer, (please see Figure 7), but it does not teach explicitly that the exposure wavelength is between the 248 and 436 nm. However the specification fails to teach the criticality of having these particular wavelengths would overcome any problem in the prior art and since Nose et al teaches that by changing the thickness of the thin film the peaks of the transmission may be changed, it is therefore obvious modifications to one skilled in the art to design the pellicle thin film to have the desired peaks for the benefits of utilizing it in different wavelength applications as desired.

Response to Arguments

7. Applicant's arguments with respect to claims 7-14, 16-24 and 26-30 have been considered but are moot in view of the new ground(s) of rejection. The newly amended claims have been fully considered and they are rejected for the reasons stated above.

8. In response to applicant's arguments concerning the rejections of claims under 35 USC 112, first paragraph, the applicant is respectfully reminded that the features (the increases of thickness of anti-reflection film coating and the increase in thickness of the thin film) recited in the Remark that are relied to overcome the rejections are not in the claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). The rejections therefore still hold.

9. In response to applicant's arguments concerning the rejections of claims under 35 USC 112, second paragraph, the applicant is respectfully reminded that the features (design thickness for producing transmission maxima) recited in the Remark that are relied to overcome the rejections are not in the claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). The rejections therefore still hold.

10. Applicant's arguments concerning the prior art rejections have been fully addressed in the paragraphs above.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Art Unit: 2872

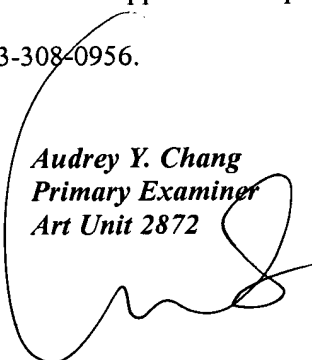
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 703-305-6208. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 703-305-0024. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Audrey Y. Chang
Primary Examiner
Art Unit 2872



A. Chang, Ph.D.